REMARKS

Claims 1 and 3 are amended, Claims 9-16 and 21-24 are cancelled, and Claims 25-34 are added. Claims 1-3, 5-8 and Claims 25-34, as amended, remain in the application. No new matter is added by the amendments to the claims.

The Rejections:

In the Office Action dated February 11, 2008, the Examiner rejected Claims 1, 2, 8-13, and 21-24 under 35 U.S.C. 103(a) as being unpatentable over Nakagaki et al. U.S. Patent No. 6598707 in view of Eastcott et al. U.S. Patent No, 4108280.

Regarding Claim 1, the Examiner stated that Nakagaki discloses an elevator installation having a car, referred to as cage 20, and a counterweight 30 connected by a drive means, referred to as front and back hoist cables 50, 60, and movable in a shaft 7 comprising:

a pair of car guides 22, 23 adapted to be mounted in the shaft 7;

a pair of counterweight guides 31, 32 adapted to be mounted in the shaft;

a crossbeam, referred to as connecting beam 33, attached to the counterweight guides 31, 32 and to car guide 22; and

a drive motor, referred to as hoist 41, mounted on the crossbeam 33 and coupled to a pair of drive pulleys, referred to as front and back traction sheaves 44, 45, adapted for engaging the drive means 50, 60 to move the car 20 and the counterweight 30 in the elevator shaft 7 wherein the drive pulleys 44, 45 are operatively drivingly connected by a drive shaft with the drive motor and a brake, the drive pulleys 44, 45 being spaced apart and positioned adjacent opposite sides of the car guides 22, 23, shown in Figures 1,3, and 4.

The Examiner commented that Nakagaki is silent concerning the drive pulleys are arranged between the drive motor and the brake on the drive shaft wherein a spacing between the drive pulleys is less than an axial length of the drive motor. According to the Examiner, Eastcott teaches drive pulleys 10a, 11 a are arranged between a drive motor 42, 45 and a brake, comprised of 32-35, on a drive shaft 12a wherein a spacing between the drive pulleys 10a, 11a is less than an axial length of the drive motor 42, 45, and it would have been obvious to one of ordinary skill in the art at the time of the invention to arrange the pulleys disclosed by Nakagaki between a drive motor and a brake as taught by Eastcott to facilitate arrangement of components due to

space restraints. It would have been obvious to one of ordinary skill in the art at the time of the invention to space the drive pulleys disclosed by Nakagaki less than an axial length of the drive motor as taught by Eastcott to position the cables at a desired spacing. Furthermore, it would have been obvious to one of ordinary in the art at the time of the invention was made to space the drive pulleys disclosed by Nakagaki less than an axial length of the drive motor, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding Claim 2, the Examiner stated that Nakagaki discloses the drive pulleys 44, 45 are arranged on opposite sides of an imaginary line horizontal connector of the car guides 22, 23.

Regarding Claim 8, the Examiner stated that Nakagaki further discloses the counterweight guides 31, 32 and the car guide 22 are positioned at apices of a substantially horizontal triangle and the crossbeam 33 is fastened at end regions to the counterweight guides 31, 32 and at a center region to the car guide 22.

Regarding Claim 9, the Examiner stated that Nakagaki further discloses the car guides 22, 23 and counterweight guides 31, 32 are arranged to extend substantially vertically in the elevator shaft and the crossbeam 33 is arranged to extend substantially horizontally in the elevator shaft.

Regarding Claim 10, the Examiner stated that Nakagaki discloses an elevator installation having a car, referred to as cage 20, and a counterweight 30 connected by a drive means, referred to as front and back hoist cables 50, 60, and movable in an elevator shaft comprising:

an elevator shaft 7;

an elevator car 30 movable in the elevator shaft 7 along a pair of car guides 22, 23 mounted in the elevator shaft 7;

a counterweight 30 movable in the elevator shaft 7 along a pair of counterweight guides 31, 32 mounted in the elevator shaft 7;

a crossbeam, referred to as connecting beam 33, attached to the counterweight guides 31, 32 and one of the car guides 22; and

a gearless drive motor, referred to as hoist 41, mounted on the crossbeam 33 for engaging the drive means 50, 60 and moving the car 20 and the counterweight 30 in the elevator shaft 7, the drive motor 41 being drivingly connected by a drive shaft 42, 43 to a pair of drive pulleys 44,

45 engaging the drive means 50, 60, the drive pulleys being spaced apart adjacent one another and positioned adjacent opposite sides of one of the car guides 22.

The Examiner commented that Nakagaki is silent concerning a spacing between the drive pulleys is less than an axial length of the drive motor. According to the Examiner, Eastcott teaches a spacing between the drive pulleys 10a, 11 a is less than an axial length of a drive motor 42, 45, and it would have been obvious to one of ordinary skill in the art at the time of the invention to space the drive pulleys disclosed by Nakagaki less than an axial length of the drive motor as taught by Eastcott et al. to position the cables at a desired spacing. Furthermore, it would have been obvious to one of ordinary in thc art at the time of the invention was made to space the drive pulleys disclosed by Nakagaki less than an axial length of the drive motor, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding Claim 11, the Examiner stated that Nakagaki discloses two drive means 50, 60 connecting the car 20 and the counterweight 30, each drive means 50, 60 having two ends, referred to as anchoring ends 53, 57, 63, 67, and each of the ends 53, 57, 63, 67 being fixed to one of the car guides 23, via cage-side hitching beam 25, and the crossbeam 33.

Regarding Claim 12, the Examiner stated that Nakagaki discloses two drive means 50, 60 connecting the car 20 and the counterweight 30 and wherein the drive means 50, 60 are belts.

Regarding Claim 13, the Examiner stated that Nakagaki discloses the car 20 is suspended in the elevator shaft 7 with a 2:1 ratio and the drive motor 41 is arranged in a region above a travel path of the counterweight 30 in the elevator shaft 7, shown in Figures 1, 2, 4, and 5.

Regarding Claim 21, the Examiner stated that Nakagaki discloses an elevator installation having a car 20 and a counterweight 30 connected by a drive means 50, 60 and movable in an elevator shaft 7 comprising:

a pair of car guides 22, 23 adapted to be mounted in the elevator shaft 7;

a pair of counterweight guides 31, 32 adapted to be mounted in the elevator shaft 7;

a crossbeam 33 attached to the counterweight guides 31, 32 and one of the car guides 22;

a drive motor 41 mounted on the crossbeam 33 and connected to a drive shaft 42, 43; and

a pair of drive pulleys 44, 45 adapted for engaging the drive means 50, 60 to move the car 20 and the counterweight 30 in the elevator shaft 7 wherein the drive pulleys 44, 45 are drivingly connected to the drive shaft 42, 43 and are positioned spaced apart adjacent to one another on opposite sides of an imaginary line connector extending between the car guides 22, 23 and adjacent opposite sides of one of the car guides 22.

The Examiner commented that Nakagaki is silent concerning a spacing between the drive pulleys is less than an axial length of the drive motor. According to the Examiner, Eastcott teaches a spacing between the drive pulleys 10a, 11 a is less than an axial length of a drive motor 42, 45, and it would have been obvious to one of ordinary skill in the art at the time of the invention to space the drive pulleys disclosed by Nakagaki less than an axial length of the drive motor as taught by Eastcott to position the cables at a desired spacing. Furthermore, it would have been obvious to one of ordinary in the art at the time of the invention was made to space the drive pulleys disclosed by Nakagaki less than an axial length of the drive motor, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding Claim 22, the Examiner stated that Nakagaki discloses the counterweight guides 31, 32 and the car guides 22, 23 are positioned at apices of a substantially horizontal triangle and end regions of the crossbeam 33 are fastened to respective ones of the counterweight guides 31, 32.

Regarding Claim 23, the Examiner stated that Nakagaki discloses a center region of the crossbeam 33 is attached to one of the car guides 22.

Regarding Claim 24, the Examiner stated that Nakagaki discloses the drive motor 41 is in an area of the triangle substantially above the counterweight 30.

The Examiner rejected Claim 3 under 35 U.S.C. 103(a) as being unpatentable over Nakagaki in view of Eastcott, and further in view of Cox U.S. Patent No. 3559768. The Examiner stated that Nakagaki discloses the drive means are belts, referred to as front and back hoist cable 50, 60, but is silent concerning the drive pulleys are smaller in diameter than the drive motor and/or brake. According to the Examiner, Cox teaches drive pulleys 11, 25 are smaller in diameter than the drive motor 14 and brake 15, and it would have been obvious to one of ordinary skill in the art at the time of the invention to make the diameter of the drive pulleys

disclosed by Nakagaki smaller than the drive motor and brake as taught by Cox because a smaller diameter sheave results in a reduced torque and an increased rotation speed of the drive motor, which increases the efficiency of the drive motor.

The Examiner rejected Claims 5 and 6 under 35 U.S.C. 103(a) as being unpatentable over Nakagaki in view of Eastcott, and further in view of Yasuda et al. U.S. Patent No. 6488124.

Regarding Claim 5, the Examiner commented that Nakagaki is silent concerning the drive motor and the brake are mounted on a bracket fastened to the crossbeam. According to the Examiner, Yasuda teaches a drive motor 126 and a brake 118 are mounted on a bracket, referred to as support legs 120, fastened to the crossbeam 108, and it would have been obvious to one of ordinary skill in the art at the time of the invention to mount the drive motor and the brake disclosed by Nakagaki on a bracket fastened to the crossbeam as taught by Yasuda to facilitate the connection between the drive motor and the brake, and the crossbeam.

Regarding Claim 6, the Examiner commented that Nakagaki is silent concerning a bracket mounted at a center region of the crossbeam. According to the Examiner, Yasuda teaches the bracket 120 is mounted at a center region of the crossbeam 108, and it would have been obvious to one of ordinary skill in the art at the time of the invention to mount the bracket as taught by Yasuda at a center region of the crossbeam disclosed by Nakagaki to facilitate the connection between the drive motor and the brake, and the crossbeam.

The Examiner rejected Claim 7 under 35 U.S.C. 103(a) as being unpatentable over Nakagaki in view of Eastcott and Yasuda, and further in view of Cox. The Examiner commented that Nakagaki is silent concerning the drive pulleys arranged substantially in a region within an enclosure of the bracket. According to the Examiner, Cox teaches drive pulleys 11, 25 arranged substantially in a region within an enclosure of the brackets, not numbered but shown attached to of the elevator shaft shown in Figure 1, and it would have been obvious to one of ordinary skill in the art at the time of the invention to arrange the drive pulleys disclosed by Nakagaki substantially in a region within an enclosure of the bracket as taught by Cox to make the drive pulleys readily accessible with the bracket.

The Examiner rejected Claims 14-16 under 35 U.S.C. 103(a) as being unpatentable over Nakagaki in view of Eastcott, and further in view of Yasuda.

Regarding Claim 14, the Examiner stated that Nakagaki discloses a car 20 suspended in an elevator shaft 7 with a 2:1 ratio and a drive motor 41, but is silent concerning a drive motor arranged in a region above a travel path of the car. According to the Examiner, Yasuda teaches a car 101 suspended in an elevator shaft 103 with a drive motor 126 arranged in a region above a travel path of the car 101, shown in Figures 4-6 20, 21A, 21B, and 31-33, and it would have been obvious to one of ordinary skill in the art at the time of the invention to arrange the drive motor disclosed by Nakagaki in a region above a travel path of a car as taught by Yasuda to overcome elevator shaft size and shape constraints.

Regarding Claim 15, the Examiner stated that Nakagaki discloses a car 20 suspended in an elevator shaft 7 with a 2:1 ratio and a drive motor 41, but is silent concerning a drive motor arranged in a region above a travel path of the car and a travel path of the counterweight. According to the Examiner, Yasuda teaches a car 101 suspended in an elevator shaft 103 with a drive motor 126 arranged in a region above a travel path of the car 101 and a travel path of the counterweight 102, shown in Figures 4-6 20, 21A, 21B, and 31-33, and it would have been obvious to one of ordinary skill in the art at the time of the invention to arrange the drive motor disclosed by Nakagaki in a region above a travel path of a car and a travel path of a counterweight as taught by Yasuda to overcome elevator shaft size and shape constraints.

Regarding Claim 16, the Examiner commented that Nakagaki is silent concerning the car suspended in the elevator shaft with a 1:1 ratio and the drive motor arranged in a region above a travel path of the car. According to the Examiner, Yasuda teaches a car 101 is suspended in an elevator shaft 103 with a 1:1 ratio and the drive motor 126 is arranged in a region above a travel path of the car 101, shown in Figures 4-6 20, 21A, 21B, and 31-33, and it would have been obvious to one of ordinary skill in the art at the time of the invention to suspend the car disclosed by Nakagaki in an elevator shaft with a 1:1 ratio as taught by Yasuda and arrange the drive motor disclosed by Nakagaki in a region above a travel path of the car as taught by Yasuda to overcome elevator shaft size and shape constraints.

Applicants' Response:

Amended Claim 1 and new independent Claims 30 and 33 recite:

a drive motor drivingly coupled to the pair of drive pulleys;

a brake operatively connected with the pair of drive pulleys by a common drive shaft;

the brake and the drive motor are operatively connected with the pair of drive pulleys by the common drive shaft;

the drive pulleys are arranged between the drive motor and the brake; and

the drive pulleys are spaced apart with a spacing less than an axial length of the drive motor.

The Examiner rejected Claims 1, 2, 8-13, and 21-24 under 35 U.S.C. 103(a) as being unpatentable over Nakagaki in view of Eastcott. Nakagaki discloses a drive unit with:

a motor and a pair of drive pulleys;

the motor is drivingly coupled to the pair of drive pulleys;

the motor is arranged between the pair of drive pulleys; and

the drive pulleys are widely spaced at a distance to position the drive pulleys near the corners of the elevator car.

Taking Nakagaki as closest prior art it is an object of Applicant's invention to have a more compact arrangement of the drive unit and to get an efficient load transfer of the elevator load into elevator structure, while allowing for easy maintenance. This object is solved by the invention as recited in Applicant's independent claims. The common drive shaft allows transmission of force without space consuming couplings, gears, etc. The arrangement of the drive pulleys between the brake and the motor allows for easy exchange of worn parts on the motor and the brake. The arrangement of the drive pulleys spaced at a small distance allows a symmetrical arrangement of traction means on both sides of the car guide plane and allows an efficient transfer of the main supporting load from the drive pulleys to the support structure.

Eastcott discloses an elevator drive with two wheels. The wheels are mounted for independent rotation on a common shaft. A braking device is provided for engagement with outer faces of the wheels, while opposed inner faces of adjacent wheels are provided with braking material such that the actuation of the brake forces the wheels together and the wheels are braked as a unitary structure. Eastcott discloses the following features:

a motor and two pulleys arranged on a common shaft;

the motor is drivingly coupled to one of the pulleys;

the motor is arranged on a first end portion of the shaft, the drive pulley is arranged on middle portion of the shaft and a brake is arranged on a surround structure of the drive, acting on the wheels;

the pulleys are arranged on one side of the motor and the brake grips around the wheels;

the brake acts directly on the wheels; and

the pulleys are arranged close together to transmit braking force within the wheel structure.

Eastcott teaches away (no motivation) from Applicant's invention as recited in the independent claims. The individually rotatable wheels teaches away from drivingly coupled. The brake acting on the wheels teaches away from arrangement of brake at an end of the drive shaft. The apart spaced pulleys teaches that the wheels must be pressed together by the brake.

Also, even when combining Eastcott with Nakagaki the objects and the features of the claimed invention are not meet, because the combination still lacks:

a motor, a pair of drive pulleys and a brake arranged on a common drive shaft;

the brake operatively connected with the pair of drive pulleys by way of the common drive shaft;

the drive pulleys arranged between the drive motor and the brake; and

the drive pulleys spaced apart a distance less than an axial length of the motor.

Further inventive features are recited in Claims 3 and 25 whereby the drive motor is arranged above the travel path of the counterweight and the car and the drive pulleys are arranged above the travel path of the counterweight respectively. The drive motor itself has an optimized size to allow an efficient generation of motor torque. A cross-section of the elevator shaft is reduced therefore, because the size of counterweight might be reduced. By using small drive pulleys, which is possible by using belts as the drive means, an arrangement of the drive pulleys above the path of the counterweight is possible, which allows a straight fall of the drive means down to the deflection pulleys on the car (see Fig. 10).

Further inventive features are recited in Claims 28 and 29 whereby the drive motor is arranged above the travel path of the car and a deflecting roller is arranged above the travel path

of the counterweight respectively. Using these features separates the cross-section of the elevator shaft completely from the size of the drive equipment.

Further inventive features are cited in Claim 26 wherein the drive motor and the brake are arranged on opposite ends of the common drive shaft. This feature makes a maintenance and exchange of brake and motor parts easy.

Further inventive features are recited in Claim 27 whereby the fixation of the guide rails, which support the drive machine, is on opposed walls of the elevator shaft. Using this fixation configuration, conventional guide rails are usable without the need for having expensive support structures as shown by Nakagaki.

In view of the amendments to the claims and the above arguments, Applicant believes that the claims of record now define patentable subject matter over the art of record. Accordingly, an early Notice of Allowance is respectfully requested.